Committee on Resources
Subcommittee on Forests & Forest Health

Testimony of Dr. Larry Irwin

STATEMENT OF DR. LARRY IRWIN, SENIOR SCIENTIST FROM NCASI, INC.

I am a Principal Research Scientist with the National Council of the Paper Industry for Air and Stream Improvement, or NCASI, which is a non-advocate, nonprofit research and environmental management organization. We conduct research that seeks to reveal cost-effective options for managers to blend environmental values with economic goals. Most of the research that we undertake is conducted in cooperation with scientists from other organizations or institutions. Some 60% of the research funding for the Western Wildlife Program, which I manage, is provided by the forest products industry-, the remaining 40% comes from federal, state, or private organizations.

I was educated at the University of Montana, University of Minnesota, and University of Idaho, completing my PhD degree in 1978. Before coming to NCASI, I was a professor at the University of Wyoming for 8 years, and I currently hold facultyaffiliate appointments at Oregon State University and the University of Montana. My professional experience involves 24 years of scientific inquiry on the topic of interactions between wildlife populations and habitats. That experience has involved research on habitat dynamics and populations of large mammals as well as songbirds and predatory birds. I began field investigations on Spotted Owls in 1986, and currently supervise owl research projects in Washington, Oregon and California. I have written or co-authored about 85 scientific publications, including journal articles, several book chapters and 3 book-length monographs. About 15 publications involved Spotted Owls.

From October 1989 through spring 1990 1 served as a technical advisor/observer to the Interagency Scientific Committee, or ISC (also known as the Thomas Committee) to Address the Conservation of the Northern Spotted Owl. My purpose today is to discuss four topics relative to scientific information that has been gathered since the owl was listed as a threatened species:

- A. Spotted Owl population trends;
- B. Linking owl population trends with habitat conditions;
- C. Risks of large-scale wildfires; and
- D. The value of manipulative, adaptive management experiments.

Spotted Owl Population Trends--. There is new information about trends in Spotted Owl populations, especially as those trends may relate to habitat conditions. Wildlife scientists combine estimates of annual survival rate with data on reproduction to arrive at population trends. Survival rates cannot be accurately measured, so they are estimated indirectly by computer-based analytical models. The models translate data from repeated observations of individually identifiable, leg-banded owls. Model output from combined data from several studies has been interpreted to mean that annual adult female owl survival may be declining, and that it may be declining at an accelerating rate. If the declining survival-rate estimates can be accepted, and if they were linked statistically with measures of habitat conditions, they would certainly be cause for concern.

On the other hand, re-observations of owls at their nest sites do not defend the computer projections. One possible reason for the disparity is that the models may not account well for the ways that Spotted Owls are actually sampled in the field. It is wellknown that female owls are only rarely captured and banded (i.e., sampled) unless field crews first find their associated males. For example, a recent study demonstrated that computer models that do not account for male-dependent sampling of females could result in incorrect interpretations. And another study suggested that the computer models may be overly pessimistic because they do not account for owls that emigrate from study areas. That study suggested that population trends may be under-estimated by 3-13%.

Consequently, NCASI scientists developed a method that accounts better for the ways that owls are sampled, and under some conditions, also accounts for emigration. When we entered the data in the analytical models, we found evidence that adult female owl survival rate has been relatively stable since 1990 along the eastern slope of the Cascade Mountains in Washington. This information, which has been submitted for formal publication, suggests there is reason to be optimistic about owl population trends in that area.

Linking owl population trends with habitat conditions--. We know now that relationships between Spotted Owl populations and forest conditions are much more complex than previously believed. Old forests provided a reasonable starting basis for predicting where we might find Spotted Owls, so naturally, old forests formed the backbone of the conservation strategy. However, after the owl was listed, it soon became apparent that there was more to the owl/forest relationship than old forests, because many private timberlands without extensive old-growth forests were found to contain Spotted Owls. For example, we found 55 sites occupied by Spotted Owls in a western Oregon landscape that contains less than 1 0% mature and old-growth forests.

That information directed our studies somewhat, and we subsequently found that suitable Spotted Owl habitat involves multiple and interacting environmental factors, not just age or growth stage of forest. These additional factors include undergrowth vegetation, standing and fallen dead trees (or snags), and attributes of the physical environment. That old-growth, by itself, is weakly correlated with owl reproductive success is explained below, as there are implications for owl conservation and management.

Since 1990 1 have supervised a research project that spans most of the length of the eastern slope of the Cascades Range in Washington, extending from the Canadian border to the Oregon border. The area contains perhaps one-third of the Spotted owls in Washington. There, about 25% of over 1 00 Spotted Owl nest sites that have been sampled occur in old-growth forests. The remainder occurs in forests that are in intermediate stages of forest growth, owing to past forest fires and previous selective timber harvesting. The area contains several Federal late-successional reserves (or LSRS) that were set aside from timber harvesting to protect Spotted Owls. These late successional reserves were initially proposed to be set aside by the Thomas Committee in 1990. Subsequently, the reserve network was expanded by the President's Northwest Forest Plan in 1993. It was assumed the LSR set-asides would contain Spotted Owls that should be doing well because the areas have the most extensive mature and old-growth forests.

However, the assumption proved to be incorrect. In our study, reproductive success by Spotted Owls is not statistically correlated with amounts of old-growth forests. In fact, we found that Spotted Owls within non-reserved areas, where there is about *50% less* old-growth forests, produce *twice as many young* owlets as owls living in reserved forests along the Cascades crest. This seemingly contradictory pattern has been consistent since 1990. It is related to differences in forest types, past forestry practices and to the physical environment. In the areas where owls produce the most young, it seems that productive soils, less annual precipitation, and less rugged topography probably translate into greater abundance and availability of the

owl's food base. The result is that owls in such areas are more productive than anywhere else, despite those areas having less old-growth forests. Therefore, more factors than age or growth stage of forest are needed to make reliable predictions about reproductive success among Spotted Owls.

Risks of large-scale wildfires--. After the Spotted Owl was listed in 1990, we documented evidence of a high potential for extensive wildfires to devastate owl habitats in the eastern Washington Cascades, where forest health has deteriorated significantly. The same appears true for the eastern Oregon Cascades and the Klamath Region in southern Oregon and northern California. In 1992, scientists concluded there also was high wildfire likelihood in many areas occupied by the California Spofted Owl in the Sierra Nevada Range. The risks are highest in areas where dense, undergrowth trees create "ladder" conditions that allow small fires to reach forest canopies and escalate into landscape-scale wildfires. Such an event occurred in 1994, when over 200,000 acres burned along the eastern slope of the Washington Cascades. There, some two dozen owl sites were consumed in the fires, Therefore, we know now that we have what scientists call a "wicked ecological problem": "How can we protect Spofted Owls in forested areas with high probability of non-natural, large scale wildfires?"

The points discussed above have several ramifications. First, forest planners would be well-advised to be cautious about relying only on maps of the most extensive old forests to locate reserve areas for long term owl conservation. Second, owls have apparently colonized forests that have re-grown after previous timber harvests that left standing dead and downed trees. Third, preserving a network of the oldest forests may not be optimal in the long run for Spofted Owls in fire-prone areas. What we might consider doing about these topics is my fourth point, described below.

The value of manipulative, adaptive management experiments--. There are significant opportunities for developing compatibility between Spofted owls and forestry. For example, it should be possible to re-condition forests in fire-prone areas and yet maintain the owls. And it should be possible to create suitable Spofted Owl habitat more generally in judiciously managed forests. In each case, forest managers who choose to do so would need to account for the appropriate vegetation structures, in relation to the physical environmental features described above. Indeed, knowing that suitable owl habitat had been created fortuitously, or by default, in some managed forests, the Thomas Commiftee suggested that forest managers should be able to produce it by design.

Note that this doesn't mean that scientists are certain about how to provide for a viable population of Owls in managed forests over the long term. However, there is sufficient information to point us in the right direction. Creating and maintaining Spotted Owl habitat after clearcut timber harvesting most likely cannot be done in less than 3040 years in most Douglas-fir forests. Given that, the issue in such forests is partly one of scheduling forest treatments over time and across the landscape, which forest managers know how to do. And it is partly an issue of how much structure to leave behind, as well as where to put the structures. In forest types where less-intensive forestry practices, such as partial timber harvesting, may efficiently be used to reduce the risks of fire, it may well be that owls will continue using the treated stands. Or perhaps there will be a short hiatus, after which the owls re-use the treated forest stands. In fact, several scientists have indicated that they believe that carefully-applied partial cutting would not degrade habitats in the short term and that such treatments may well improve habitat conditions for owls over the long run.

Developing the potentials of either method for accommodating Spotted Owls in managed forests requires more development. Both topics require manipulative forest experiments designed to test several promising options simultaneously. Such active "adaptive management" requires linking reses-ch with monitoring to point out the optimal direction for management. To our knowledge, adaptive management activities

indicated by the Thomas Committee in 1990, including developing silvicultural programs compatible with Spotted Owls, have yet to become operational. Indeed, Federal monitoring and research programs for Spotted Owls have been significantly reduced.

In summary, then, there is significant information on Northern Spotted Owls that applies at levels of forest stands to landscapes. However, there seems to be no formal mechanism for infusing new scientific information into decision-making processes. Therefore, I respectfully suggest that the Subcommittee on Forestry of the House Resources Committee consider impaneling a body of scientists, perhaps through the National Research Council, to review the information, to evaluate barriers that seem to impede rapid application of useful information, and to recommend actions that could improve conservation and management for Northern Spotted Owls.

Further, and mindful of the need for judicious budgeting, the following specific suggestions are proposed:

- 1) Support increased funding for Spotted Owl research, especially that which links monitoring of Spotted Owl population trends with habitat conditions and environmental attributes.
- 2) Encourage the research programs to emphasize rapid development and application of silvicultural methods that are both compatible with Spotted Owls and will reduce risks of wildfire in fire-prone forests.
- 3) Enable adaptive management programs that could support a suite of conservation strategies that protect Spotted Owls across a landscape mosaic of managed and unmanaged forests. Such programs should contain provisions for regularly updating federal agency staff to promote rapid application in management.

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